Abstract:

An electromagnetic matched filter based multiple access communications system having a source of modulated pulses from a digital data stream; an initial filter which shapes the incoming modulated pulse into a desired pulse for transmission across the communication medium; a second filter, identical to the initial filter, which is matched to the pulse which exit the communications medium, a detector which converts the modulated pulse stream into the original digital data stream, and signals which are designed with specific mathematical properties which make the system efficient and minimizes crosstalk between channels. The signals decay rapidly from the central lobe at a higher than 1/x rate and the zero points of the autocorrelation function having high order multiplicities. The type of system allows multiplexing of multiple data streams with much greater flexibility, robustness, and density.